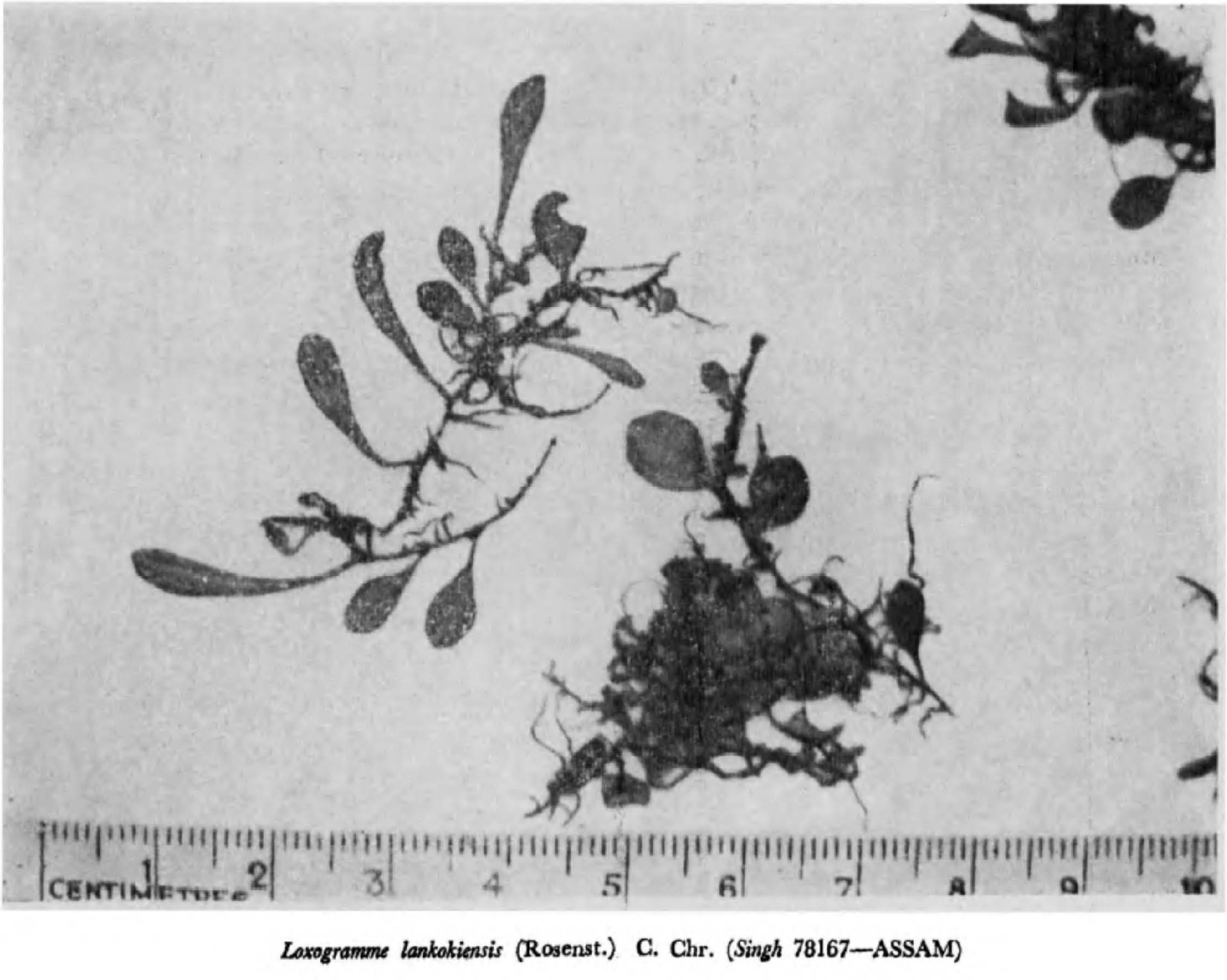
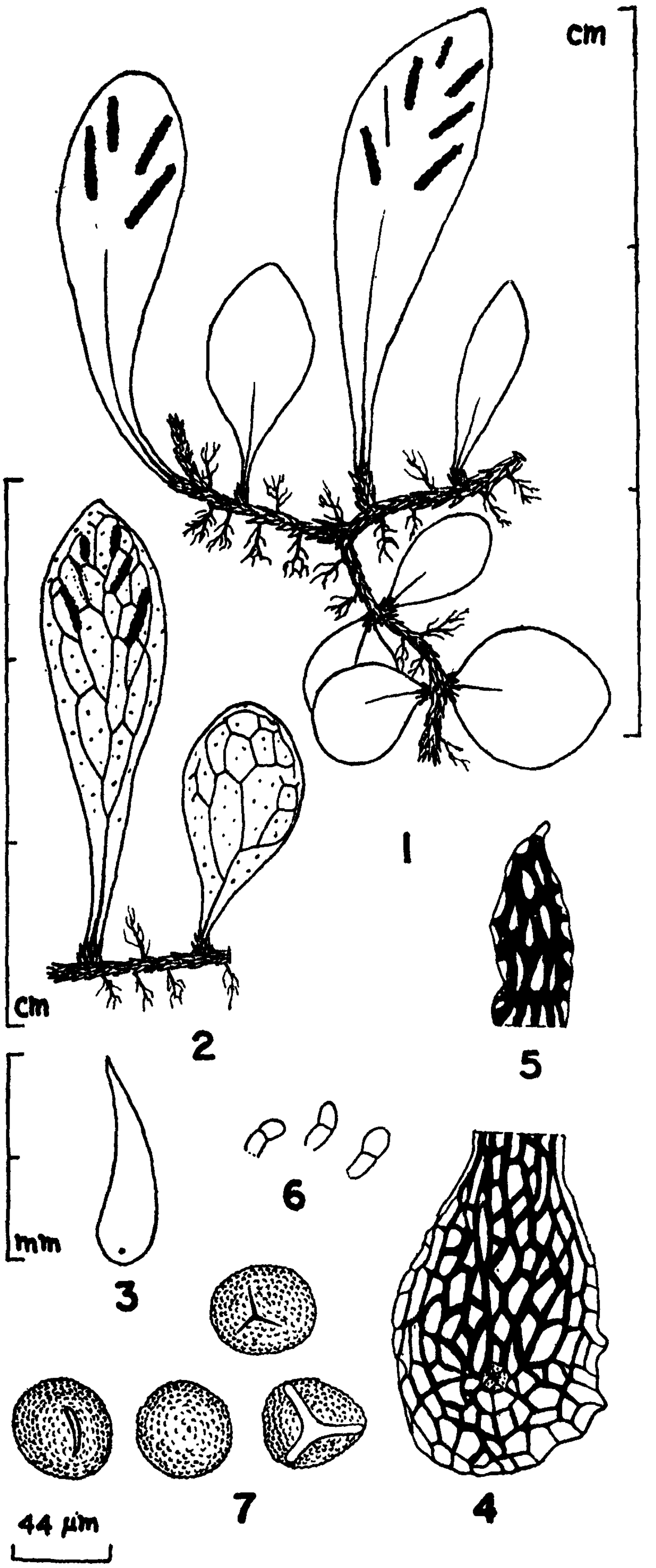
# NOTES ON TWO SPECIES OF *LOXOGRAMME* PRESL (PTERIDOPHYTA) IN THE EASTERN HIMALAYAS

*Loxogramme grammitoides* (Bak.) C. Chr. (*Gymonogramme grammitoides* Bak.) lectotypified by Ching (Ic. Fil. Sin. t. 189. 1937) with 'Hupeh, Ichang, *Henry* 5451', is characterised by 'fronds uniform to rarely dimorphous, 3.0-10.0 cm long, 5-10 mm wide, rachis distinct and visible up to the apex and paleae on the rhizome basal'. Tagawa in Hara (1966) identified correctly a collection, 'Darjeeling, Garihans, 7 June 1960, *Hara, Kanai, Murata, Tugashi* & *Tuyama* *s.n.* (CAL) with *L. grammitoides* (Bak.) C. Chr.

A comparative study of the description, illustration and comments on *L. grammitoides* sensu Bhargavan and Joseph (1980), based on *Joseph* 48934 collected from the Lohit District, Arunachal Pradesh, with Ching (*l.c.*) t. 189 and the specimen from Darjeeling in CAL, as referred to above, convinces us that they are not appropriately identified. *Joseph* 48934, as also *Singh* 78167 from the neighbouring Tirap district, are better identified with *Loxogramme lankokiensis* (Rosent.) C. Chr. (*Polypodium lankokiensis* Rosenst.). This species is characterised by



*Loxogramme lankokiensis* (Rosenst.) C. Chr. (*Singh* 78167—ASSAM) ‘dimorphic fronds, the sterile ones up to 2 cm long and 1.3 cm wide, the ferile ones 1.4-3.0 cm long and 3-7 mm wide ; the rachis slightly raised and visible towards base and up to the middle and peltate palea on the rhizomes’



*Loxogramme lankokiensis* (Rosenst.) C. Chr.
Figs. 1-7 : 1. Habit. 2. Fronds showing venation. 3. Palea. 4. Basal portion of palea magnified (× 70). 5. Apex of palea magnified (×70). 6. Trichomes. 7. Spores. (*Singh* 78167—ASSAM)

*Polypodium lankokiensis* Rosenst. (1917) is typified with *Balansa* 1934 from Lankok in Tonkin. Presumably unaware of this, C. Chr. (1929) described *Loxogramme microphyllum* C. Chr. based on the same gathering, *viz*. *Balansa* 1934. Therefore, *L. microphyllum* C. Chr. is *nom. illeg.* (Art. 7.11 and Art. 63.1, ICBN 1983).

**Loxogramme lankokiensis** (Rosenst.) C. Chr. Ind. Fil. Suppl. III : 125, 1934 ; Tagawa and Iwatsuki in Acta Phytotax. Geobot. 24 (1-2) : 60. 1969.

*Polypodium lankokiensis* Rosenst. Med. Rijks. Herb. Leiden, No. 31 : 5. 1917. Type : Tonkin (mt. Bavi), Lankok, 12 June 1888, *Balansa* 1934 (LE, -holo ; B-iso. ; vide C. Chr. 1929). *Drymoglossum subcordatum* Fée var. *obovatum* Baker in J. Bot. 28 : 267. 1890, *nom. nud.*

*Loxogramme microphyllum* C. Chr. in Dansk. Bot. Arkiv. 6(3) : 48. pl. 3, f. 6. 1929, *nom. illeg.* Type : Same as for *L. lankokiensis* Rosenst.

*L. grammitoides* sensu Bhargavan and Joseph in New Botanist 5 : 43, f. 1-6. 1980 (1978), non (Bak.) C. Chr. (1917).

*Rhizome* wide-creeping, 0.5 mm across, paleaceous ; roots covered with brown, simple, elongated, persistent root-hairs ; *palea* up to 2 mm long, 0.5 mm wide, peltate, lanceolate, entire or slightly toothed at base, acute, brown, concolorous, heterotoechae, on the rhizome and base of fronds. *Fronds* dimorphic, lamina coriaceous, drying dull green and bearing on the lower surface brown, scattered, 2-celled trichomes ; *sterile fronds* up to 20 mm long, 13 mm wide, sessile, obovate (or slightly spathulate) to rotund, entire and with obtuse apex ; *fertile ones* 14-30 mm long, 3-7 mm wide, sessile, spathulate to oblanceolate, entire with obtuse apex and rachis raised on dorsal surface up to 1/3-1/2 of the lamina ; veins hidden, reticulate, without included free veinlets. *Sori* up to 3 mm long, oblique, sunk in elongated grooves which are raised on the dorsal surface, exindusiate, paraphyses absent. *Spores ca.* 40 × 44 $\mu$m, usually trilete, (but a few monolete also seen), hyaline and colliculate.

*Specimens examined* : INDIA : Arunachal Pradesh : Tirap District, Miao (Zoological park), *ca.* 400 m, 26 Sept. 1980, *Singh* 78167 (ASSAM).

*Ecology* : An epiphyte growing in furrows of old tree-trunks on shady-places in tropical evergreen forest. The rhizome is much interwoven and forms a large patch comparable to some filmy ferns ; however, Bhargavan and Joseph (*l.c.*), as also Tagawa and Iwatsuki (*l.c.*) report it as a 'hygrophytic lithophyte' growing on stones in river bed.

*Distribution* : INDIA : (Arunachal Pradesh). THAILAND and VIETNAM (Tonkin).

In Eastern Asia, occurrence of four species of *Loxogramme* (Bl.) Presl, each with dimorphic fronds, *viz. L. biformis* Tagawa, *L. conferta* Copel., *L. dimorpha* Copel. and *L. lankokiensis* (Rosenst.) C. Chr., has been reported. The following key would be an aid to distinguish the allied taxa from each other, either in the field or in herbaria :

1a. Fronds more than 10 cm long
  2a. Sterile fronds 10-15 cm long, 3.0-3.5 cm wide ; fertile fronds *ca.* 22 cm long, 1-2 cm wide, oblanceolate-linear ; sori in 5-10 oblique rows on each side of the midrib .. *L. biformis*
  2b. Sterile fronds 20-30 cm long, 2-3 cm wide ; fertile fronds up to 40 cm long, 0.2-0.4 cm wide, narrowly linear ; sori in one parallel row on each side of the midrib .. *L. dimorpha*
1b. Fronds never more than 5(-6) cm long
  3a. Sterile fronds imbricating, orbicular or short-elliptic with cordate base ; fertile fronds 25-35 mm long, 3.5-5.0 mm wide .. *L. conferta*
  3b. Sterile fronds not imbricating (widely spaced), orbicular to obovate with cuneate base ; fertile fronds 14-30 mm long, 3-7 mm wide .. *L. lankokiensis*

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